MRID No. 156044

DATA EVALUATION RECORD

1. **CHEMICAL:** Orthophenylphenol

2. **TEST MATERIAL:** Dowicide 1 antimicrobial (technical o-phenylphenol); CAS No. 90-43-7; 99.25% purity; a light pink, crystalline solid.

3. **STUDY TYPE:** Freshwater Fish Acute Tests.
   Species Tested: Pimephales promelas
   Lepomis macrochirus
   Salmo gairdneri.

4. **CITATION:** Dill, D.C., D.P. Milazzo, E.A. Bartlett, and G.U. Boggs. 1985. Evaluation of the Toxicity of Dowicide 1 Antimicrobial, Technical O-Phenylphenol, to Representative Aquatic Organisms: ES-811. Prepared and submitted by Dow Chemical U.S.A., Midland, Michigan. MRID Number 156044. TRID Number 470128-009.

5. **REVIEWED BY:**

   Prapimpan Kosalwat, Ph.D.
   Staff Toxicologist
   KBN Engineering and
   Applied Sciences, Inc.

   Signature: P. Kosalwat
   Date: 9/25/88

6. **APPROVED BY:**

   Isabel C. Johnson, M.S.
   Principal Scientist
   KBN Engineering and
   Applied Sciences, Inc.

   Signature: James R Meyers for ICJ
   Date: 9/26/88

   Henry T. Craven, M.S.
   Supervisor, EEB/HED
   USEPA

   Signature:
   Date:

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for freshwater fish tests. With 96-hour LC50 values of 4.0 to 5.5 mg/L, Dowicide 1 antibacterial is considered moderately toxic to fathead minnow (Pimephales promelas), bluegill (Lepomis macrochirus), and rainbow trout (Salmo gairdneri). The NOELs were <2.6, 3.2, and 1.8 mg/L for fathead minnow, bluegill, and rainbow trout, respectively.

8. **RECOMMENDATIONS:** N/A.

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Animals: Fathead minnow (Pimephales promelas) and rainbow trout (Salmo gairdneri) were from Dow Chemical Laboratory culture, while bluegill (Lepomis macrochirus) were from a pond culture. The descriptions of each fish species are presented on pages 7-10 of the report (attached).

B. Test System: The tests were conducted in 12-L Pyrex battery jars, each containing 10 L of test solution. Characteristics of the test water (standard dilution water) are presented on paged 7-10 of the report (attached). Test solutions were prepared using the dilution water. The test jars were kept in constant temperature water troughs at 17 $\pm$ 1°C for fathead minnow and bluegill, and 12 $\pm$ 1°C for rainbow trout. The tests were conducted under a 16-hour light photoperiod.

C. Dosage: 96-hour acute static tests.

D. Design: The nominal test concentrations for definitive tests were selected, based on separate range-finding tests for each fish species. The test for each fish species was initiated when 10 fish were exposed to each test concentration and a dilution water control, one vessel per concentration. The fish were not fed during the test. The test for fathead minnow was conducted twice in order to get a more precise LC50.

Dissolved oxygen, pH, and temperature were measured daily in representative vessels. Mortalities were recorded and dead fish removed daily.

E. Statistics: Thompson's moving average, probit analysis, and binomial method were used to calculate LC50 values and the corresponding 95% confidence intervals.

12. REPORTED RESULTS: An investigation of the stability of the test material in standard laboratory dilution water under the test conditions showed that >96% of the initial levels were present after 96 hours.

Water quality data measured during the tests, mortality data; and 24-, 48-, 72-, and 96-hour LC50 values are presented on pages 7-10 of the report (attached).

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES: The 96-hour LC50 values (with their corresponding 95% confidence intervals) of Dowicide 1 were 4.7 (3.6-6.0) and 5.5 (4.7-6.6) mg/L for fathead minnow; 4.6 (4.4-4.9) mg/L for bluegill; and 4.0 (3.6-4.5) mg/L for rainbow trout. Therefore, the test material was moderately toxic to all three fish species.

The study was conducted in the spirit of FDA and EPA Laboratory Practice Regulations. The study phases were inspected and the final report was signed by the Quality Assurance Unit of Dow Chemical U.S.A.

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

A. Test Procedure: The test procedures and report were in general accordance with the SEP, except for the following deviations:

o The conditions of the laboratory, where fathead minnow and rainbow trout had been reared, were not reported. Likewise, there was also no information on the pond conditions where bluegill had been reared.

o The test fish were smaller than the recommended size of 0.5-5.0 g.

o The hardness of the water used in the test was slightly higher than the recommended hardness of 40 to 48 mg/L as $CaCO_3$.

o There was no 15-to 30-minute transition period between light and dark photoperiod.

o The temperature was not monitored every six hours as recommended by the guidelines for a test system controlled by a water bath.

B. Statistical Analysis: The reviewer recalculated the 96-hour LC50 values using EPA's TOXANAL computer program and obtained the same results (see attached printouts).

C. Discussion/Results: The 96-hour LC50 values of 4.0 to 5.5 mg/L classify Dowicide 1 antimicrobial as moderately toxic to fathead minnow, bluegill, and rainbow trout. The no-observed-effect levels (NOELs) were determined to be <2.6, 3.2, and 1.8 mg/L for fathead minnow, bluegill, and rainbow trout, respectively.

D. Adequacy of the Study:

(1) Classification: Core.

(2) Rationale: Although the test procedures deviated from the guidelines, the reviewer does not believe they significantly affected the toxicity results of this test.

(3) Repairability: N/A.

15. COMPLETION OF ONE-LINER: Yes, September 16, 1988.

No. _____ Chemical Name Orthophenylphenol Chemical Class _____ Page 1 of 2

(Dowicide 1 Antibacterial, Technical o-phenylphenol)

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Validat Status
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
Species	_____	Slope= # Animals/Level= Age(Days)= Sex =	_____	____
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L.) Contr. Mort.(%)=		
Species	_____	Slope= # Animals/Level= Age(Days)= Sex =	_____	____
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Age(Days)= Sex =		
Lab	_____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	_____	____
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Age(Days)= Sex =		
Lab	_____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	_____	____
Acc.		Comments:		
48-Hour LC_{50}		LC50 = 2.51 *ppm (95% C.L. 2.17 - 2.89) Contr. Mort.(%)= 3		
Species Daphnia magna		Slope= N/A # Animals/Level= 30 Sol. Contr. Mort.(%)= N/A		
Lab Dow Chemical U.S.A.	99.25	Temperature = 20c	PK/9-16-88	Core
Acc. MRID 156044		48-Hour Dose Level *ppm/(%Mortality) 0.78 (0), 1.3 (30), 2.2 (23), 3.6 (70), 6.0 (97), 10.0 (100)		
		Comments: * nominal concentration		
96-Hour LC_{50}		LC50 = 4.7 *ppm (95% C.L. 3.6 - 6.0) Con. Mor.(%)= 0		
Species Pimephales promelas		Slope= N/A # Animals/Level= 10 Sol. Con. Mor.(%)= N/A		
Lab Dow Chemical U.S.A.	99.25	Temp. = 17°C	PK/9-16-88	Core
Acc. MRID 156044		96-Hour Dose Level *ppm/(%Mortality) 0.78 (0), 1.3 (0), 2.2 (0), 3.6 (0), 6.0 (100), 10.0 (100)		
		Comments: * nominal concentration		
96-Hour LC_{50}		LC50 = 5.5 *ppm (95% C.L. 4.7 - 6.6) Con. Mort.(%)= 0		
Species Pimephales promelas		Slope= N/A # Animals/Level= 10 Sol. Con. Mort.(%)= N/A		
Lab Dow Chemical U.S.A.	99.25	Temp. = 17°C	PK/9-16-88	Core
Acc. MRID 156044		96-Hour Dose Level *ppm/(%Mortality) 2.6 (10), 3.3 (10), 4.1 (0), 5.1 (0), 6.4 (100), 8.0 (100), 10.0 (100)		
		Comments: * nominal concentration		

No. _____ Chemical Name Orthophenylphenol Chemical Class _____ Page 2 of 2

Study/Species/Lab/Accession | Chemical % a.i. | (Dowicide 1 Antibacterial, Technical Results o-phenylphenol) | Reviewer/Date | Validat Status

14-Day Single Dose Oral LD_{50}

LD50 = mg/kg (95% C.L.) Contr. Mort.(%) =

Species _____ Slope = # Animals/Level = Age(Days) = Sex =

Lab 14-Day Dose Level mg/kg/(% Mortality)

( ), ( ), ( ), ( ), ( )

Acc. Comments:

14-Day Single Dose Oral LD_{50}

LD50 = mg/kg. (95% C.L.) Contr. Mort.(%) =

Species _____ Slope = # Animals/Level = Age(Days) = Sex =

Lab 14-Day Dose Level mg/kg/(% Mortality)

( ), ( ), ( ), ( ), ( )

Acc. Comments:

8-Day Dietary LC_{50}

LC50 = ppm (95% C.L.) Contr. Mort.(%) =

Species _____ Slope = # Animals/Level = Age(Days) = Sex =

Lab 8-Day Dose Level ppm/(%Mortality)

( ), ( ), ( ), ( ), ( )

Acc. Comments:

8-Day Dietary LC_{50}

LC50 = ppm (95% C.L.) Contr. Mort.(%) =

Species _____ Slope = # Animals/Level = Age(Days) = Sex =

Lab 8-Day Dose Level ppm/(%Mortality)

( ), ( ), ( ), ( ), ( )

Acc. Comments:

48-Hour LC_{50}

LC50 = pp__ (95% C.L.) Contr. Mort.(%) =

Species _____ Sol. Contr. Mort.(%) =

Slope = # Animals/Level = Temperature =

Lab 48-Hour Dose Level pp /(%Mortality)

( ), ( ), ( ), ( ), ( )

Acc. Comments:

96-Hour LC_{50}

LC50 = 4.6 *ppm (95% C.L. 4.4-4.9) Con. Mor.(%) = 0

Species Lepomis macrochirus Slope = 31.1 # Animals/Level = 10 Sol. Con. Mor.(%) = N/A Temp. = 17°C PK/9-16-88 Core

Lab Dow Chemical U.S.A. 99.25

96-Hour Dose Level ppm/(%Mortality)

3.2(0), 3.5(0), 3.9(0), 4.4(30), 4.9(70), 5.4(100), 6.0(100)

Acc. MRID 156044

Comments: * nominal concentration

96-Hour LC_{50}

LC50 = 4.0 *ppm (95% C.L. 3.6-4.5) Con. Mort.(%) = 0

Species Salmo gairdneri Slope = N/A # Animals/Level = 10 Sol. Con. Mort.(%) = N/A Temp. = 12°C PK/9-16-88 Core

Lab Dow Chemical U.S.A. 99.25

96-Hour Dose Level *ppm/(%Mortality)

1.2(0), 1.5(0), 1.8(0), 2.3(0), 2.9(0), 3.6(0), 4.5(100), 5.6(100), 7.0(100)

Acc. MRID 156044

Comments: * nominal concentration